Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Beth Israel Deaconess Medical Center Climate Resilience Plan

Developed in 2023

Beth Israel Lahey Health
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I. Executive Summary

Beth Israel Deaconess Medical Center (BIDMC), a prominent healthcare institution within Beth Israel Lahey Health, presents its comprehensive Climate Resilience Plan to address the escalating challenges posed by climate change. This plan is a manifestation of BIDMC's commitment to patient well-being, community health, and operational continuity in the face of climate-related adversities. Developed in collaboration with internal and external stakeholders, the plan reflects BIDMC's dedication to excellence in care despite evolving climate challenges.

Climate Change & Resilience:

Recognizing the profound impact of climate change on health, BIDMC joined the Department of Health & Human Services (HHS) Health Sector Climate Pledge in April 2022, committing to the development of a climate resilience plan by the end of 2023. Leveraging the guidance of the Practice Greenhealth Resilience Planning Cohort, the plan aligns with BIDMC's mission to enhance facilities, foster community collaboration, and improve patient experiences.

Healthcare Without Harm's 3-pillar Model:

Embracing Healthcare Without Harm's (HCWH) 3-pillar model for climate-resilient health systems and communities, the plan encompasses health care facility, public infrastructure, and community health resilience.

Current Climate Resilience Best Practices:

BIDMC has a strong foundation in climate resilience, focusing historically on healthcare facilities and public infrastructure resilience. Noteworthy best practices include comprehensive emergency plans, flood hardening processes, and sustainable facility design.

Community Health Resilience:

Recognizing the interplay between climate change and community health, BIDMC staff and physicians are actively engaged in research, collaborations, and initiatives to enhance community health resilience. Partnerships, research projects, and fellowship programs (e.g. Emergency Medicine Climate & Health Fellowship) underscore commitment to understanding and mitigating the health impacts of climate change on vulnerable populations.

Addressing Vulnerabilities & Risks:

An internal assessment identified key vulnerabilities, categorized by priority, forming the basis for the Climate Resilience Plan. Notable vulnerabilities include patient and staff impacts, lack of specific data on infrastructure impacts, building infrastructure challenges, and external limitations. Quarterly and annual evaluations will track progress, and the plan will be presented annually to the Environment of Care Committee.

Next Steps to Mitigate Top Vulnerabilities:

Strategic steps include enhancing hazard vulnerability assessments, integrating climate resilience features into project standards, adapting maintenance practices, and collaborating with internal departments and external partners. BIDMC's commitment extends to understanding inequitable health outcomes, preparing for medical needs during climate events, and actively participating in community initiatives.

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II. Introduction

A. Who is Beth Israel Deaconess Medical Center?

Beth Israel Deaconess Medical Center (BIDMC) is a part of Beth Israel Lahey Health (BILH), which includes 15 hospitals spread across eastern Massachusetts and southern New Hampshire. BIDMC is a Level 1 Trauma Center and Harvard Medical School teaching hospital in Boston, MA with 766 beds and a large research footprint. BIDMC has two campuses, located along Brookline Avenue that consists of 29 buildings that total 3.7 million square feet and range in construction from 1903 to 2023. BIDMC consists of affiliated locations throughout the greater Boston area. BIDMC's mission is to provide extraordinary care, where the patient comes first, supported by world-class education and research. The campus is located within the Longwood Medical and Academic Area (LMA). The LMA is supported by the Longwood Collective, a non-profit organization that provides programs and services that support the activities and initiatives of the area's world-renowned organizations; services include transportation, security and emergency preparedness, building development, and coordination with city wide services. BIDMC's membership in the Longwood Collective enables cross-organizational and city-wide collaboration to ensure that the needs of the area are met and considered during city-wide planning efforts. To ensure a healthcare perspective is present at the city-level, BIDMC is also a member of A Better City (ABC). ABC facilitates opportunities to contribute to the welfare and future of Boston across the focus areas of Transportation & Infrastructure, Land Use & Development, and Energy & Environment.

B. Climate Change Context & Planning Process

The City of Boston faces increasing challenges from climate change, including rising temperatures, sea level rise, and extreme precipitation. These events are putting pressure on infrastructure, utilities, and communities. Committed to delivering exceptional patient care, BIDMC recognizes the critical links between climate and health. As a healthcare organization, the impact of climate change on communities and operations cannot be overlooked. In April 2022, BIDMC joined the Department of HHS Health Sector Climate Pledge, pledging to develop a climate resilience plan for continuous operations by the end of 2023, anticipating the needs of groups in communities that are disproportionately impacted by climate change.

To fulfill this commitment, we've joined the Practice Greenhealth Resilience Planning Cohort, utilizing their guidance to shape BIDMC's plan. This roadmap aligns with the dedication to improving facilities, fostering community collaborations, and enhancing the patient experience. As climate change intensifies, Beth Israel Deaconess Medical Center aims to lead in safeguarding patient well-being, community health, and operational continuity through this Climate Resilience Plan. Developed collaboratively with internal and external stakeholders, the plan highlights BIDMC's best practices, vulnerabilities, and outlines strategies for increasing resilience.

Through this process, it was highlighted that BIDMC's focus has historically been on adopting sustainable practices and bolstering emergency response protocols, reinforcing commitment to provide exceptional care despite climate challenges. Departments such as Emergency Management, Capital Facilities & Engineering, Support Services, and Maintenance are diligently planning for emergencies. The evolving impacts of climate change are beginning to stress-test internal policies and procedures.

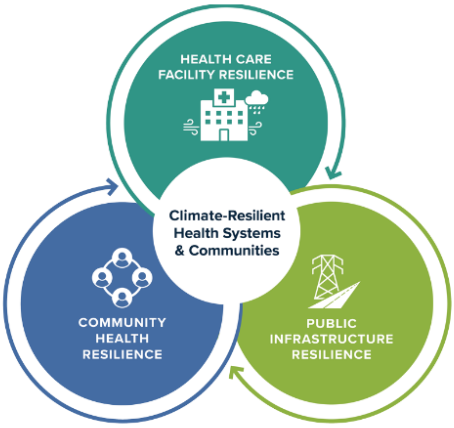

Figure: HCWH's 3-pillar model for climate-resilient health systems & communities

BIDMC's climate resilience efforts in the past have been centered on facility infrastructure and public utilities through flood hardening processes. However, today, the healthcare industry is redefining climate resilience to be inclusive of community health in its response. BIDMC's ongoing process assesses how climate change may disrupt campus operations and define roles in supporting affected community and patients. This initiative sets a precedent for healthcare resilience, underscoring dedication to patient health and community well-being.

While designing this plan, BIDMC wanted to understand current best practices and identify areas to improve climate resilience at BIDMC. BIDMC used the Department of HHS Health Care Facility Resiliency Checklist as a guide and started by splitting up the checklist by departmental responsibilities and identified key leaders within these departments to conduct an internal assessment in response. After reviewing their answers, the internal team met with each of these departments to discuss resilience best practices and vulnerabilities. The aim was to use this process to measure climate resilience and collaborate with experts in each required area to develop a plan that will continue to make an impact for years to come. The results of these discussions are reflected in this document.

III. Current Climate Resilience Best Practices

The HHS Checklist provides a comprehensive guide to strengthen healthcare facility resilience, public infrastructure resilience, and community health resilience. To date, BIDMC has focused on identifying vulnerabilities on healthcare facilities and public infrastructure resilience and have only begun to explore community health resilience.

Below is a table explaining the breakdown of the sections of the HHS Health Care Climate Resiliency Checklist. BIDMC added an additional section not included in this original checklist to highlight Community Health Resilience best practices as well (see section F, 'Community Health Resilience'). Section IV, 'Addressing Vulnerabilities and Risks', of this document highlights BIDMC's plan to understand how to integrate within and be an active member of the community to increase community health resilience.

HHS Health Care Climate Resiliency Checklist	
Section of Checklist	**Overview of Section**
Section 1: Climate Risks and Community Vulnerabilities	- Maintaining up-to-date data on climate hazards and community climate and health vulnerabilities - Using hazard vulnerability analyses to inform health services and infrastructure planning - Understanding of the role of the hospital within the community during and after extreme weather events - Utilizing this knowledge to inform resilience strategies
Section 2: Land Use, Building Design, and Regulatory Frameworks	- Understanding and cataloging the area and context within which the facility is situated - Considering the greater local and community land use vulnerabilities that may impact the facility in the face of extreme weather
Section 3: Infrastructure Protection and Resilience	- Constructing and retrofitting critical facilities with reliable communications, energy, water, and waste infrastructure to withstand events over the anticipated life of the structure
Section 4: Essential Clinical Care Service and Delivery Planning	- Ensuring that essential clinical care services remain operational during and immediately following extreme weather events
Section 5: Environmental Protection and Strengthening of Ecosystems	- Protecting and supporting ecosystems and natural buffers to mitigate extreme weather hazards that may threaten BIDMC's facilities

A. Climate Risks and Community Vulnerabilities

BIDMC is committed to staying prepared to assess climate risks and respond in a way that will increase the benefit to the surrounding community. The Emergency Management Department annually leads key stakeholders through a hazards vulnerability assessment (HVA), which provides a common understanding and quantification of the historical and current hazard risks that the facility faces.

To address the known risks, the Emergency Management Department maintains and continuously evaluates several plans and documents to manage emergencies which follow an "all hazards" approach that promotes preparedness, mitigation, response, and recovery of severe weather events:

BIDMC's Current Best Practices	
Plans	**Description**
Emergency Operations Plan	All-hazards plan for response to any variety of emergencies occurring in areas that could impact the operations of BIDMC. Increases resilience because it outlines how to handle all types of emergencies to efficiently continue operations.
Severe Weather Plan	Plan that puts processes in place that adequately prepare staff, patients, and visitors, hardens the facility, and maintains critical functions, when appropriate, before, during, and after impactful weather events.
Shelter in Place Plan	Plan for sheltering-in-place patients, staff, and visitors when the internal or external environment poses a specific threat that affects the environment of care and could disrupt treatment and services. This increases climate resilience because it highlights preparedness for events that would cause us to shelter-in-place while still offering care.
Management of Utility Disruption Plan	This plan is to be activated in response to events that require significant resource support during a utility disruption with the aim to maintain institutional operations and continue to provide a safe environment of care. This increases climate resilience because it outlines what to do if utilities are compromised.

These plans include general guidelines for how BIDMC will respond to emergencies and return to normal operations. BIDMC also has a vast system of weather alerts through Boston Public Health, the Massachusetts Department of Public Health, and a contract with Weather Works through BILH to allow ample time to prepare for a climate event. BIDMC aims to map intensity and probability of extreme weather events across campuses, so that vulnerabilities can can continue to be addressed over time.

B. Land Use, Building Design, and Regulatory Context

BIDMC recognizes the importance of understanding how its location impacts climate resilience. Below is a list of BIDMC's best practices in this area.

BIDMC's Current Best Practices
Land Use, Building Design and Regulatory Context

- An annual evaluation to address any landscaping risks (e.g dead trees or branches) that could be a hindrance during evacuation
- Partnership and membership of the Longwood Collective:
  - Provides a collaborative Longwood area emergency management plan and hazard specific plan annexes to address area wide emergencies and events
  - Provides access to a Longwood area Emergency Operations Center for area wide emergencies and events
  - Ensures collaboration with other nearby organizations, the City of Boston, and the Massachusetts Bay Transit Authority (MBTA) to provide input on evacuation routes and reinforce the necessity of early emergency alerts (e.g. public transit shutdowns or detours)
  - Provides additional preparedness as they have their own documented emergency plans and are able to assist in coordination of detour/evacuation logistics across the entire area
  - Connects the LMA's planning processes to the City of Boston
- Capital Facilities & Engineering continues to prioritize capital projects that increase flood resilience. Projects that have been completed to date (images on the following page):
  - Bricking in window and duct openings
  - Raising areaways
  - Fitting egress doors with flood barricades
  - Reinforcing potential openings to flood waters such as garage doors
  - Raising emergency power fuel oil controls
  - Protecting emergency power fuel oil pumps

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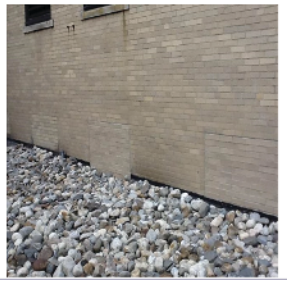
Improvements made during flood hardening:

Areaways raised

Before **After**


Window and Duct openings bricked in

Before **After**

Protected-in-place emergency power fuel oil pumps

Before **After**


Rosenberg Flood Pumps

Sub-basement **Discharge**


Egress doors fitted with de-mountable barricades

Points of Egress **After**


Flood pumps protect sub-basement infrastructure

East Campus **West Campus**


C. Infrastructure Protection and Resilience Planning

As a healthcare facility, it is important that infrastructure and communication systems can withstand events, so that patient care and services can continue during emergencies. Below is a list of BIDMC's best practices in this area.

BIDMC's Current Best Practices
Infrastructure Protection and Resilience Planning

- Multiple communication systems are set up to operate during emergencies, including radio systems, landline and mobile phones, and electronic health record and systems
- Majority of energy is received through the tri-gen plant, the Medical Area Total Energy Plant (MATEP), which provides us with two lines each of electricity and steam; BIDMC also has connectivity to the electrical grid
- BIDMC is serviced by the Boston Water and Sewer Commission (BWSC). BWSC has established redundancies across its entire system to the LMA. BIDMC has at least two feeds that cross connect in its buildings
- BIDMC has backflow preventer valves installed on every water main entering its buildings that are tested regularly by the BWSC
- BIDMC has a Net Zero by 2050 commitment; this commitment prioritizes projects that not only enable increased resilience through reduction of energy usage, but also prioritizes projects that are focused on decarbonization that mitigate the institution's impact on climate change
- Implementation of water conservation projects that focus on reducing the institution's daily water usage through low flow faucets, toilets, and sterilizers
- BIDMC has developed Critical Infrastructure Binders which map out the redundancies, burn rates of resources (e.g. fuel), and the appropriate plans for infrastructure systems
- Campus expansion that incorporates key sustainable design elements that focus on energy and water conservation. A few examples of this are the design elements of the Klarman Building that opened in April 2023:
  - Energy-efficient heating and cooling systems: Chilled beams provide heating, cooling, and ventilation throughout the building. This technology dramatically reduces heating, cooling, and fan energy consumption, compared to traditional HVAC systems.
  - Rainwater harvesting: Rainwater is collected from the roof to reduce runoff and is directed through a vortex filtration system to enable reuse of water for the cooling tower and irrigation of the healing garden. The rainwater harvesting tank has the capacity to hold 38,000 gallons of rainwater and is designed to offset 50% of the cooling tower monthly water demand.
  - High performance envelope reduces heat transfer in all seasons, which reduces heating loads in the winter and cooling loads in the summer.
  - Francis Street building façade: "zig zag" wall design helps with cooling load in the summer by increasing shade.

D. Essential Clinical Care Service Delivery Planning

It is critical that clinical care services remain operational throughout all extreme weather events. Below is a list of BIDMC's best practices in this area.

BIDMC's Current Best Practices
Essential Clinical Care Service Delivery Planning

- Plans and processes in place:
  - Partnership with external suppliers, to be able to maintain an adequate onsite supply or have processes to prolong onsite supply availability in the event BIDMC is unable to be resupplied for up to 96 hours (e.g. food and drinkable water)
  - Shelter in place plans to maintain staffing to support patient care, which includes onsite sleeping strategies
- As mentioned above, BIDMC has multiple plans to prepare to operate through climate and weather events
- Critical clinical engineering devices and medical equipment are tracked throughout the facilities to ensure easy redeployment
- Active monitoring of infectious disease cases, across the state, country, and globe; enabling a proactive preparedness and response to any potential increases in the surrounding area
- Food Services has designed a disaster menu/policy to ensure the well-being of staff and patients during an emergency allowing the continuity of care
- High level of coordination with regional healthcare and emergency response partners to mitigate climate related impacts to facilities and to ensure access to care for Greater Boston residents

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E. Environmental Protection and Ecosystem Adaptations

BIDMC understands how protecting and supporting ecosystems will help mitigate extreme weather hazards that may threaten the campus. Below is a list of BIDMC's best practices in this area.

BIDMC's Best Practices
Environmental Protection and Ecosystem Adaptation

- BIDMC's Commuter Benefits department offers support for employees to find the most efficient and most cost-effective method of transportation to get to work:
  - Commuting programs have been designed for flexibility and to ensure that BIDMC remains a leader in encouraging low-carbon emission transportation methods, such as public transportation, biking, shuttle services, carpool and parking programs, that improve air quality across the Metro Boston area
- BIDMC's Food Service Department has:
  - Prioritized diversification of the supply chain through local sourcing
  - Established a commitment to move towards lower greenhouse gas emission footprint for food procurement; this involves shifting towards plant-based diets
- BIDMC's Infection Control Department recognizes the important intersection between sustainability and infection control practices and has led in conducting a national survey to understand the role of infection control in environmental sustainability. The intent is to utilize these survey results to inform and benchmark practices across BILH.
- The Muddy River is a series of brooks and ponds that run through sections of the Boston's Emerald Necklace and borders two sides of the Longwood Medical Area; historically, the Muddy River increased the risk of flooding to this area, but years of restoration, with one of the main goals set as 'flood damage reduction', and ongoing maintenance has increased the resilience to the area. With the completion of the dredging project, the Longwood Collective continues to be actively involved in the restoration of the project area and communications related to potential flooding events, serving as an advocate for the institutions of the LMA for any continued vulnerabilities (figure below).

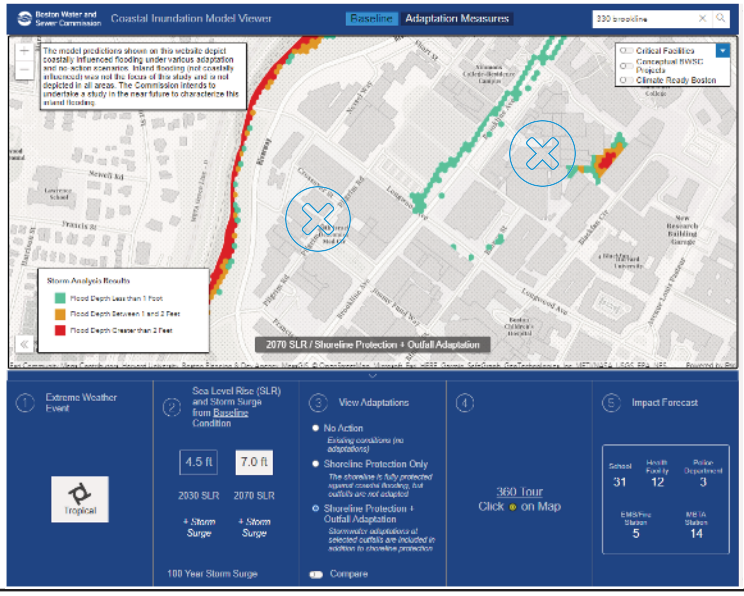

Figure: Boston Water and Sewer Flood projections for the area. BIDMC's two campuses are marked by the blue X's.

BIDMC's Best Practices

Environmental Protection and Ecosystem Adaptation

- Evaluation of heat vulnerability of the LMA is being led by the Longwood Collective; an exercise of heat mapping has been conducted by them to understand priority areas for potential installation of green/white roofs to combat the heat island effect in the area. This study will lead to recommendations for this area in the future to reduce the impacts of a heat island. Please note the large number of existing white/low albedo rooftops in the LMA resulting in reduced heat compared to existing communities. See figures below of initial study results.

Figure: Longwood Collective/KZLA mapping of LEED-Certifiable buildings in the LMA

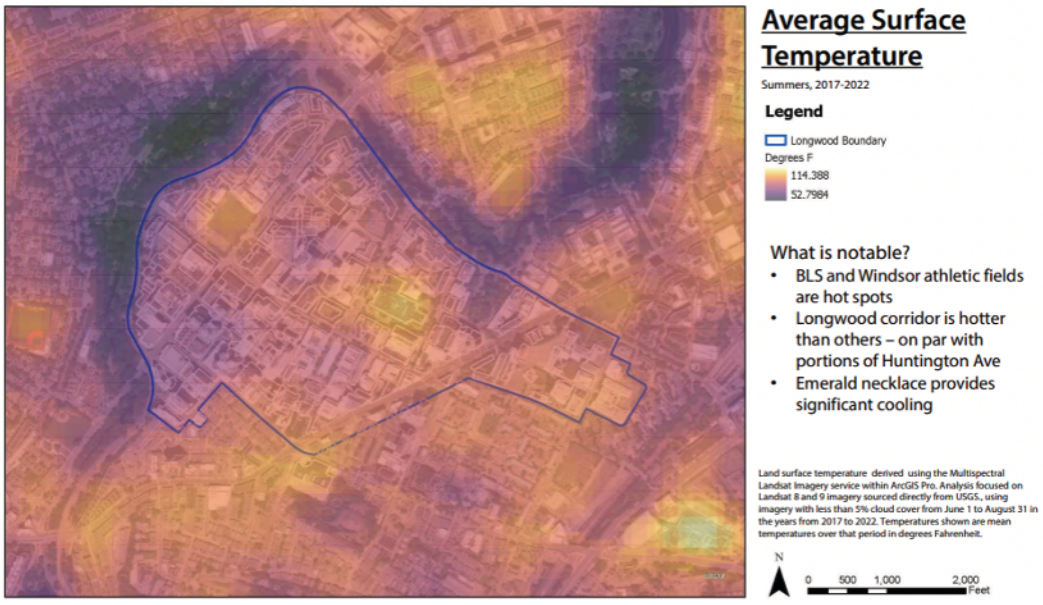

Figure: Longwood Collective / KZLA mapping of Average Surface Temperature in the LMA

F. Community Health Resilience

Community resilience is an integral component of a comprehensive climate resilience plan for a hospital. As the impacts of climate change continue to intensify, it is essential to prioritize the well-being and inclusivity of the local community. Community resilience refers to the ability of a community to effectively respond, adapt, and recover from the adverse impacts of climate-related events while maintaining the well-being of its residents.

One of BIDMC's core values is to provide high-quality, equitable care to everyone in the community. Leading this effort is BIDMC's Community Benefits Advisory Committee and administrative and clinical staff. Additionally, BIDMC has several physicians who are leading research to understand further the health impacts of climate change on local and global communities with the intent to understand potential interventions that would be feasible from a healthcare perspective. Continuing to build community resilience requires the collaboration of various stakeholders, including local government agencies, non-governmental organizations, community-based organizations, community leaders, healthcare providers, educational institutions, and the residents of the community.

Below is a summary of how BIDMC is currently addressing community health resilience.

BIDMC's Best Practices
Community Health Resilience

- **BIDMC Community Benefits:**
  - BIDMC is committed to improving the health and well-being of residents within the Community Benefits Service Area. Through the Community Benefits Department, BIDMC works in collaboration with the area's residents and key community stakeholders to address the health needs and priorities identified by this assessment.
  - BIDMC is a part of the Boston Community Health Collaborative, a group of Boston health centers, community-based organizations, hospitals, and community residents, that conduct a joint Community Health Needs Assessment for Boston every 3 years. The Collaborative works with the community to identify health priorities and effective ways to address them.
  - In the 2022 assessment, BIDMC asked the community to respond to the following statement related to climate change with an indication of how much they agree or disagree: "my community is prepared to protect ourselves during climate disasters, such as flooding, hurricanes, and blizzards", "the air in my community is healthy to breathe", "the water in my community is safe to drink", and "during extreme heat, people like me have access to options for staying cool". The results of the survey can be found at https://www.northsuffolkassessment.org/2022-chna-report.
- Community Benefits maintains partnerships with non-profits, regional transportation, community health centers, and other organizations within the community to ensure that community needs are met.

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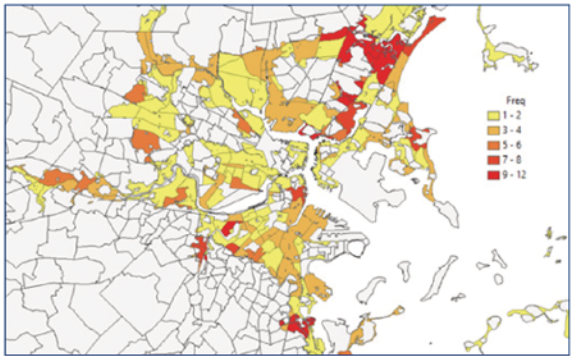
BIDMC's Best Practices

Community Health Resilience

- **BIDMC's Institute for Lung Health:**
  - This institute is a multidisciplinary research program dedicated to the prevention of respiratory disease. The core mission of the Institute is to identify preventable causes of chronic lung disease and translate research findings into patient care and health policies that improve lung health. The Institute investigates the effects of climate-related events and factors (e.g. wildfires, air pollution, extreme heat , indoor air quality, aeroallergens, and extreme weather) on pulmonary health.
- **Climate and Human Health Fellowship**
  - BIDMC's Climate and Human Health Fellowship trains physicians to examine and advance evidence-based approaches to building climate-ready communities and health systems. This two-year experiential fellowship includes a master's degree in public health, research projects focused on community- and hospital-based resilience and response strategies, and policy and advocacy training with partners in the US and beyond. Fellows hold clinical appointments at BIDMC and academic appointments at Harvard Medical School, the FXB Center for Health and Human Rights, and the Center for Climate, Health, and the Global Environment at the Harvard T.H. Chan School of Public Health (Harvard C-CHANGE). Opportunities also exist for trainees in BIDMC's Infectious Disease and Disaster Medicine fellowships to complete concentrations or advanced training on climate-related aspects of their fields. Specific examples of the research and work conducted by physicians associated with this fellowship include:
    - Mapping of vulnerable patient populations in relation to locally relevant climate hazards. Example in image to right, which highlights patients dependent on electricity for medical care (i.e. nebulizers) and may be at risk during a flood event. (Webb E, et al, 2013)

Figure 3. Distribution of presumed nebulizer users residing in hurricane inundation zones. Darker red indicates a larger number of presumed nebulizers who may be at risk of inundation during a major hurricane.



    - Using information on weather conditions to model emergency department utilization, with the goal of optimizing operational planning in the context of climate-responsive hazards including heat and severe weather. BIDMC's researchers are currently studying potential links between weather conditions and arrival patterns in emergency departments. The results may have implications for ED staffing decisions. The results of this study will be published in the future.

IV. Addressing Vulnerabilities & Risks

After the internal assessment, BIDMC identified the vulnerabilities that need to be addressed to increase internal climate preparedness and resilience. Each vulnerability was prioritized based upon funding availability, impact to daily operations and increasing climate preparedness. These identified vulnerabilities are outlined within an internal working document that will be evaluated quarterly to assess progress, as well as annually to reassess the priority levels. It will be the responsibility of the Sustainability and Emergency Management Departments to provide accountability to the key stakeholders as the priority areas move forward. The goal of continually assessing these vulnerabilities is to track facilities improvements and overall path to climate resilience. The plan will be annually reported, at minimum, to the Environment of Care Committee at BIDMC.

The intent of creating this resilience plan is to:

- Elevate the top identified risks and vulnerabilities to internally prioritize and address as funding allows
- Ensure that there are multiple continued channels of improvement to address climate resilience
- Highlight key areas and opportunities for integration of these concepts into project design and construction processes
- Provide a platform for increased external collaboration and further research development
- Strengthen ability to foster a sense of inclusivity, collaboration, and shared responsibility to address inequitable health outcomes that are exacerbated by climate change

Top Identified Risks and Vulnerabilities
- Patient and staff population impacts (including, but not limited to, access to facilities) from severe climate emergencies - Lack of BIDMC specific data on infrastructure impacts due to climate events - Challenges within the building infrastructure and design to adapt to current climate impacts - Lack of regulatory standards around climate resilience to support the financial and staffing impacts that would be necessary to increase severe weather and climate resilience. - External limitations of infrastructure, such as power supply, and limited external resources dedicated to climate change - Lack of understanding of effective interventions for healthcare providers to implement to address community health resilience issues due to climate change

Next Steps to Mitigate Top Facility & Public Utilities Vulnerabilities

- Hazards Vulnerability Assessment (HVA) enhancement to turn towards the projections of frequency and severity of climate change events to proactively measure internal vulnerability and risk
- BIDMC's Capital Facilities & Engineering integration of decarbonization and climate resilience features into standards for existing and new projects
- BIDMC's Maintenance operations adaptation of climate resilience best practices and further understanding of increasing impacts to the building operations during climate emergencies
- Completion of in-progress resilience projects, such as flood gates deployment plan, vulnerable area mitigation and roof replacements
- New collaboration between key stakeholders on increasing climate resilience:
    - BIDMC Departments:
        - Capital Facilities & Engineering
        - Clinical Engineering
        - Community Benefits
        - Distribution & Supply Chain
        - Emergency Management
        - Emergency Medicine
        - Environmental Health & Safety
        - Environmental Services
        - Food Services
        - Health Equity
        - Human Resources
        - Infection Control
        - Information Services
        - Maintenance
        - Pharmacy
        - Primary Care
        - Support Services
        - Sustainability
        - Other Clinical Care Teams
        - Other Administrative and Leadership
- Additional support in establishing patient facing communication and education around climate emergencies for both non-emergency and emergency time frames

Next Steps to Community Health Resilience

- Increased and newly established external collaboration with Boston and surrounding area community partners to understand needs, resources, and vulnerabilities (i.e. A Better City, Boston Public Health Commission, Department of Public Health, Longwood Collective, Massachusetts Emergency Management Agency, National Oceanic and Atmospheric Administration)
- Leverage these collaborations to develop a data-driven understanding of the inequitable health outcomes that are being exacerbated by climate change in the patient population; provide further guidance on what the role of a healthcare facility should be in the climate resilience preparedness and response
- Develop an understanding of the medical needs during climate events to better prepare and support patients, as well as the types of interventions that may be effective
- Alignment of the data and research that will further enhance the BIDMC climate change impact and understanding of vulnerable patient populations; identify further opportunities to integrate lessons learned into the Emergency Medicine's Climate and Human Health and Disaster Medicine Fellowship, BIDMC's Infectious Disease Fellowship, and additional education opportunities for staff, patients, and their families
- Actively partner with Health Care Without Harm and other local healthcare institutions in the Boston Health Care Working Group of the Green Ribbon Commission on the topic of community resilience. Work ahead may include participating in the Climate Justice Network, and other collaborative planning exercises
- Collaboration with Health Care Without Harm on advocating for changes within the Community Health Needs process outlined by the Attorney General's Office, with a goal of increasing attention on local resilience planning and implementation
- **Climate and Human Health Fellowship**
  - Developing patient-centered evidence-based approaches to reducing risks of health harms from climate-related hazards; an example of this is the Climate Resilience for Frontline Clinics Toolkit which provides useful resources for health care providers, patients, and administrators at free clinics and community health centers to meet the challenges for health care from climate change.
  - Working to educate patients, policymakers, and the public about the health impacts of climate change and steps that can be taken to address them.
  - Collaboration with a team at the Global Consortium on Climate and Health Education at Columbia University to systematically review climate healthcare adaptation strategies and guidelines in Central and South America and the Caribbean; conducting a systematic review in Central and South American and Caribbean countries to see how people there are thinking about climate healthcare adaptation. This collaboration is focused on seeing what adaptation toolkits and guidelines are available, as well as conducting a literature review to see what adaptation plans have been submitted through UNFCCC. The goal is to develop a curriculum for adaptation to help healthcare systems develop adaptation plans.
- **Climate Change & Cardiovascular Prevention and Care**
  - Conducting a systematic review on climate change and cardiovascular health to understand what currently is known about these interconnections.

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V. Acknowledgments

This report was compiled by Avery Palardy, BIDMC Climate & Sustainability Director, Declan Carbery, BIDMC Director of Emergency Management, and Nicole Doering, Massachusetts Institute of Technology chemical engineering student, and created in collaboration with the following:

Internal Departments:

- Capital Facilities & Engineering
- Clinical Engineering
- Emergency Management
- Emergency Medicine
- Environmental Health & Safety
- Environmental Services
- Food Service
- Health Equity
- Infection Control
- Maintenance
- Supply Chain and Distribution
- Support Services
- Sustainability

External Organizations:

- Boston Water & Sewer Commission
- Healthcare Without Harm
- Longwood Collective
- Practice Greenhealth

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